

Ch. 1 Measurement + Geometry



Composite figure: made up of 2 or more different geometric shapes

Formulas:

AREA

- rectangle $A = l \cdot w$
- circle $A = \pi r^2$
- triangle $A = \frac{bh}{2}$

VOLUME

- prism $V = (\text{Area of base})(h)$ 
- cylinder $V = \pi r^2 h$ 

SURFACE AREA

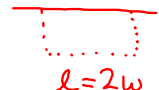
- prism $SA = 2(lw + wh + hl)$
- cylinder $SA = 2\pi r^2 + 2\pi rh$

Jan 9-12:12 PM

Optimizing

2-Dimensional

- 4 sided \rightarrow maximize area \rightarrow min. perimeter } Square

- 3 sided  make length twice width

Jan 9-12:18 PM

Optimizing

3D \rightarrow minimize surface area + maximizes volume.
 (cost of building, packaging material, paint)



$$V = lwh \text{ but } w = l, h = l$$

$$V = l \cdot l \cdot l$$

$$V = l^3$$

$$SA = 6l^2$$

ONLY FOR Cube

Cylinder

want the most Volume + the least SA

$h = d$ remember $d = 2r$

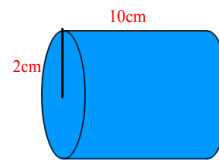
$$V = 2\pi r^3$$

$$SA = 6\pi r^2$$

ONLY for cylinder with $h = d$

Jan 9-12:19 PM

Ex. 1 Find the Volume + surface area



$$V = \pi r^2 h$$

$$V = \pi (2)^2 (10)$$

$$V = \pi (4)(10)$$

$$V = 40\pi$$

$$V = 125.7 \text{ cm}^3$$

$$\begin{aligned} SA &= 2\pi r^2 + 2\pi rh \\ &= 2\pi (2)^2 + 2\pi (2)(10) \\ &= 2\pi (4) + 2\pi (20) \\ &= 8\pi + 40\pi \\ &= 48\pi \\ &= 150.8 \text{ cm}^2 \end{aligned}$$

Note - units

$V = \text{cubed}$

$SA = \text{squared}$.

Jan 9-12:19 PM

Ex. 2 Find the length of a cube with a volume of 4096 cm^3

$$V = 4096 \text{ cm}^3$$

$$V = l^3$$

$$V = lwh$$

$$4096 = l^3$$

$$\sqrt[3]{4096} = \sqrt[3]{l^3}$$

$$16 = l$$

\therefore the length of cube is 16

p.66 #1-12

Jan 9-12:23 PM

Jan 10-9:34 AM